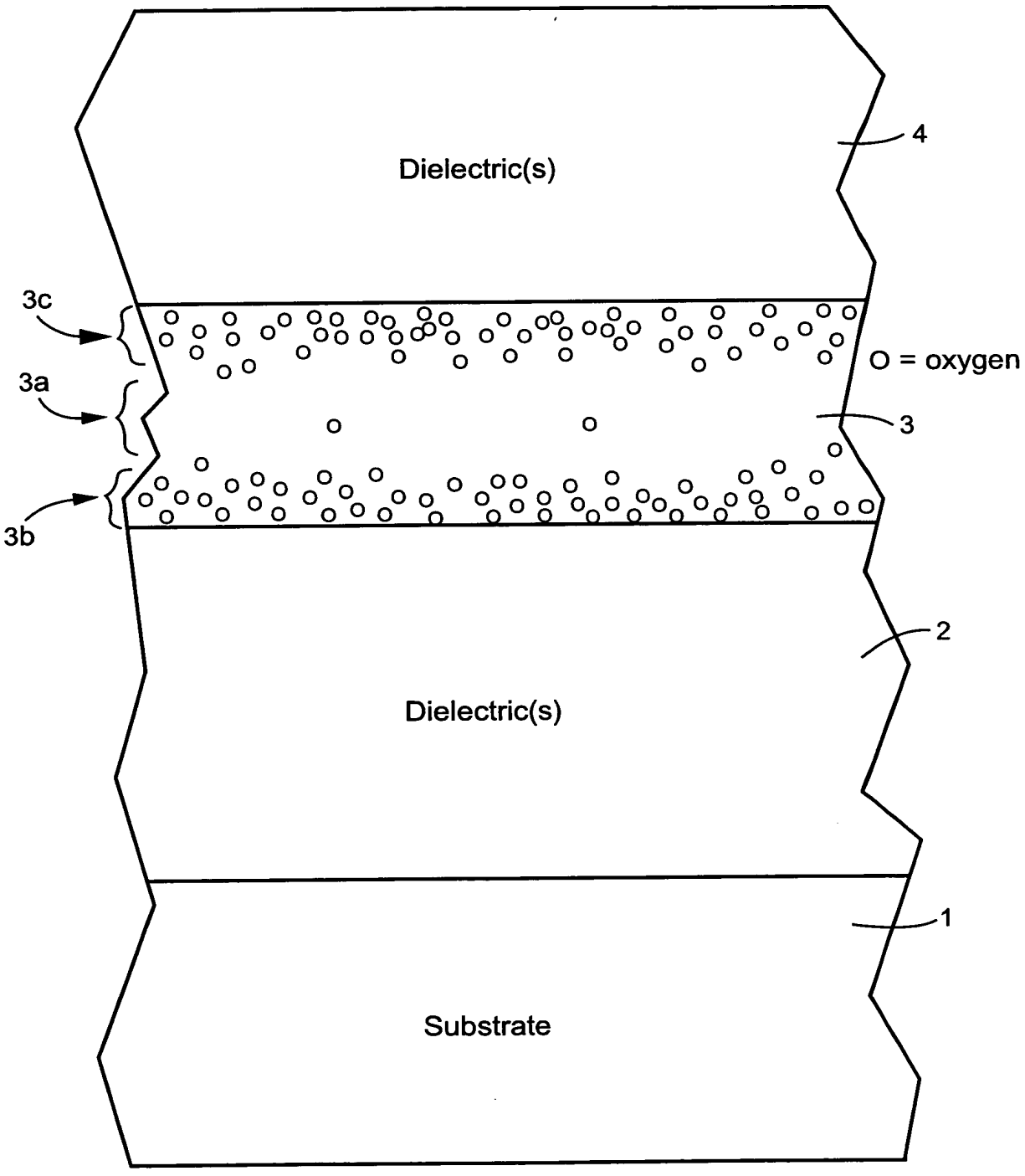

Fig. 1

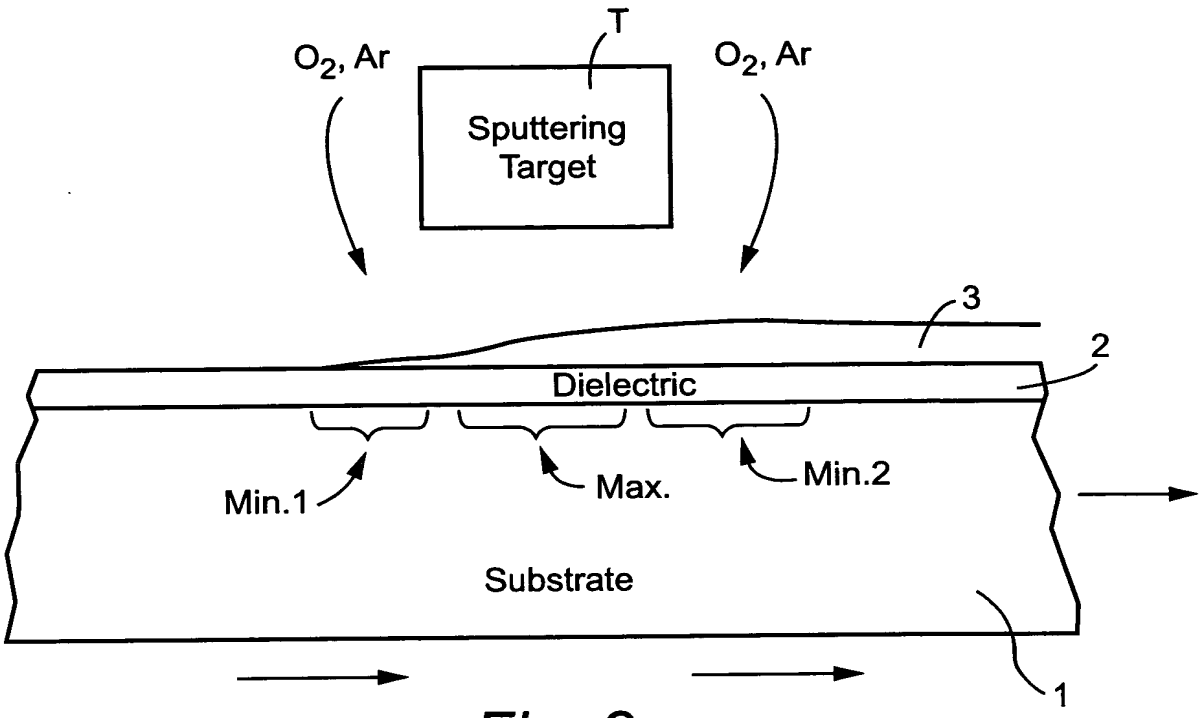
T
O_2, Ar
O_2, Ar
Sputtering Target
3
2
Dielectric
Min.1
Max.
Min.2
Substrate
1

Fig. 2

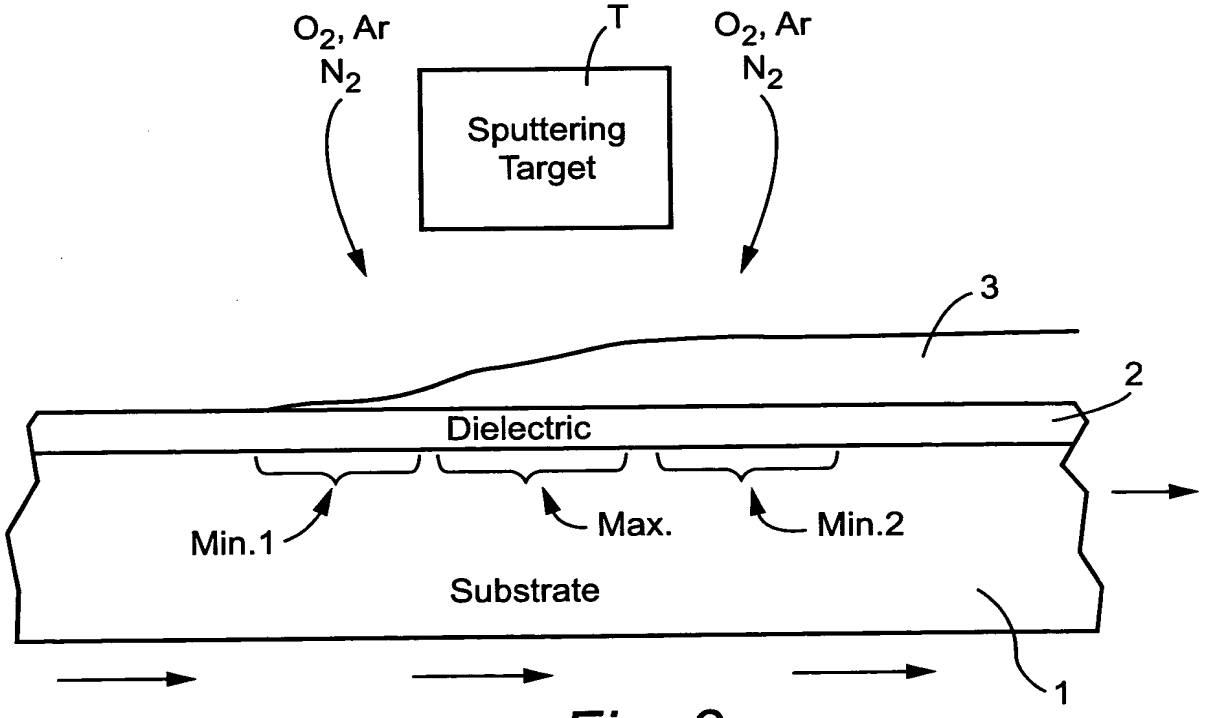
T
O_2, Ar
N_2
O_2, Ar
N_2
Sputtering Target
3
2
Dielectric
Min.1
Max.
Min.2
Substrate
1

Fig. 3

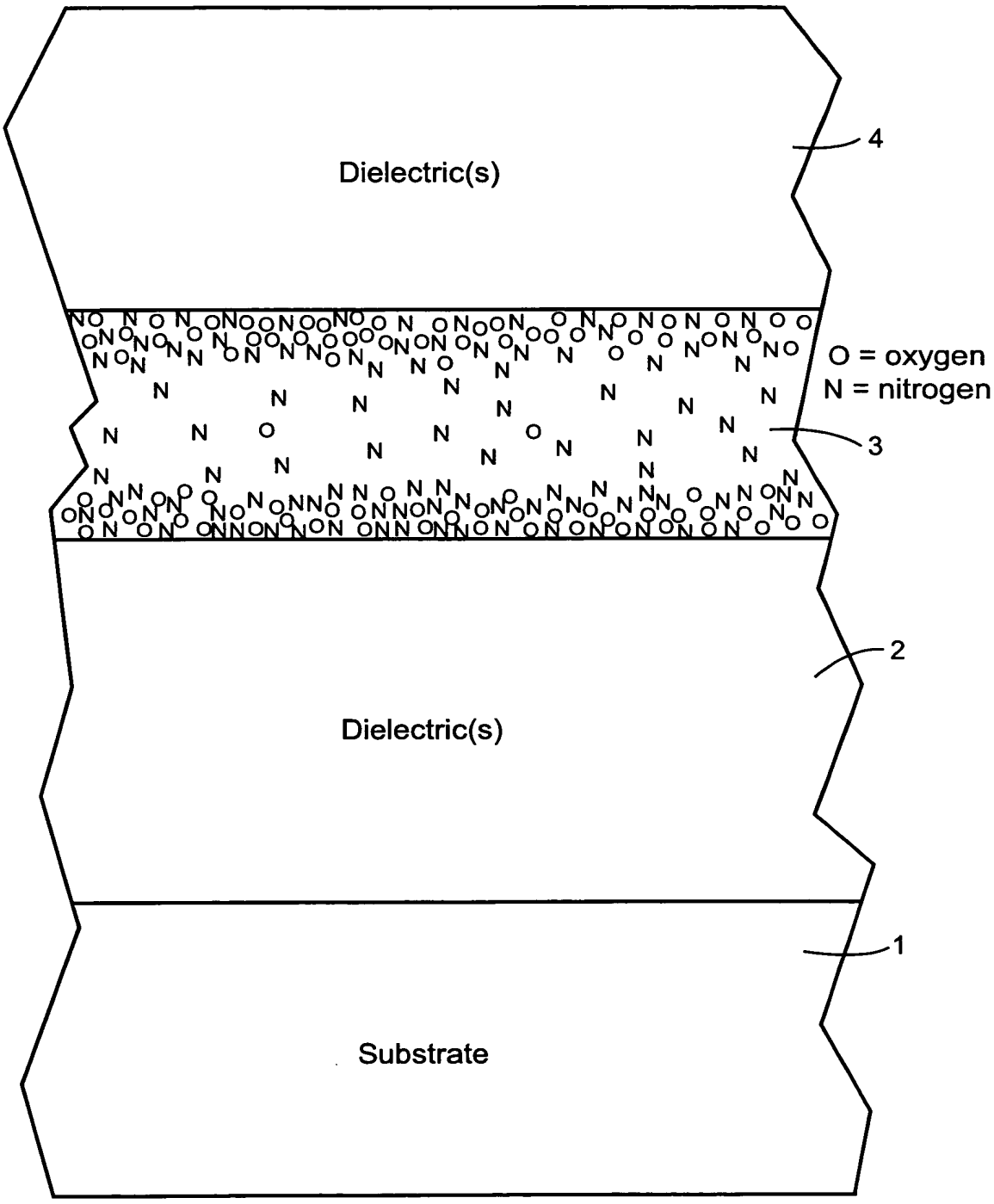
Dielectric(s)
4
O = oxygen
N = nitrogen
3
2
Dielectric(s)
1
Substrate

Fig. 4

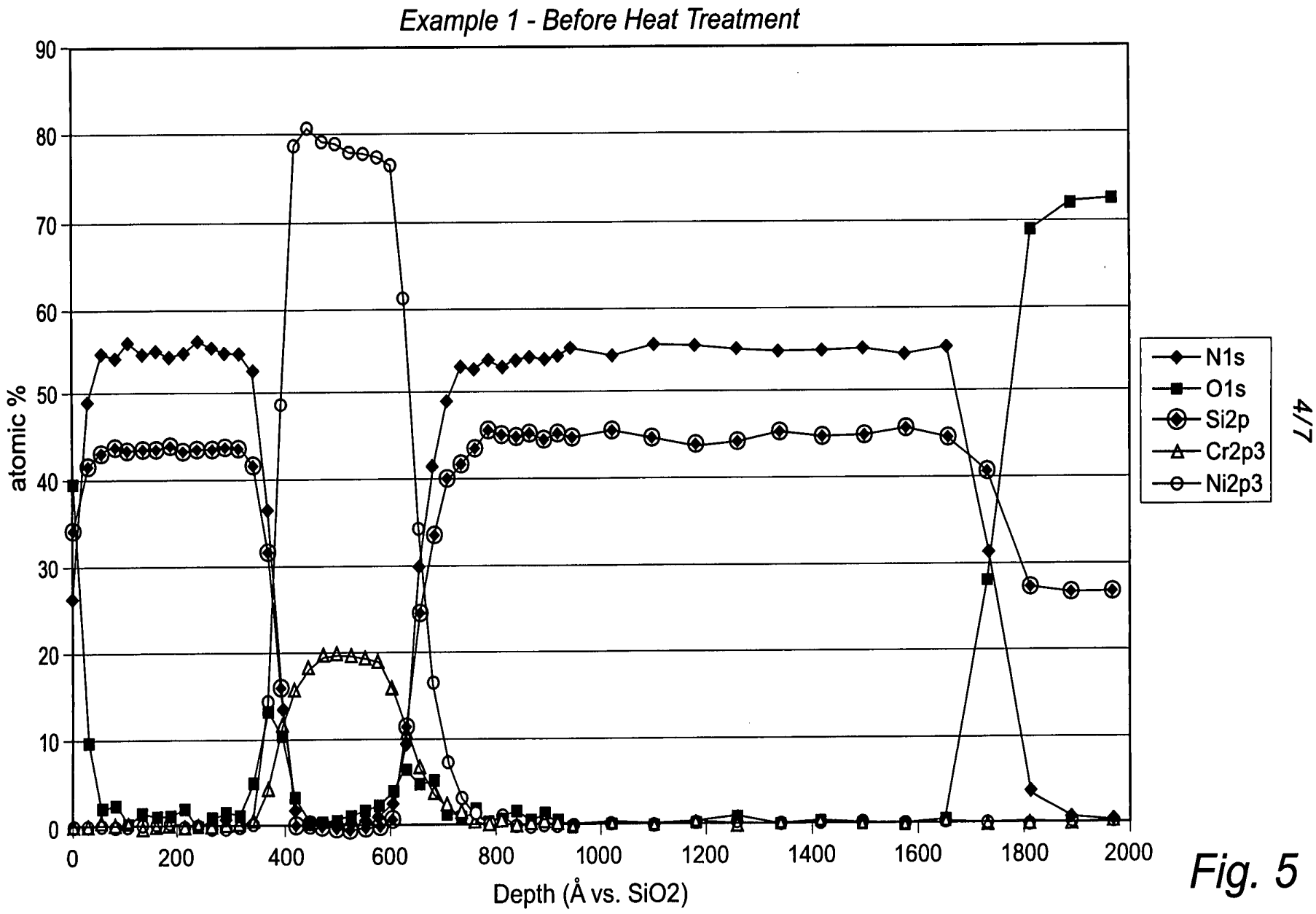
Example 1 - Before Heat Treatment
atomic %
Depth (Å vs. SiO2)
N1s
O1s
Si2p
Cr2p3
Ni2p3
0
10
20
30
40
50
60
70
80
90
0
200
400
600
800
1000
1200
1400
1600
1800
2000

Fig. 5

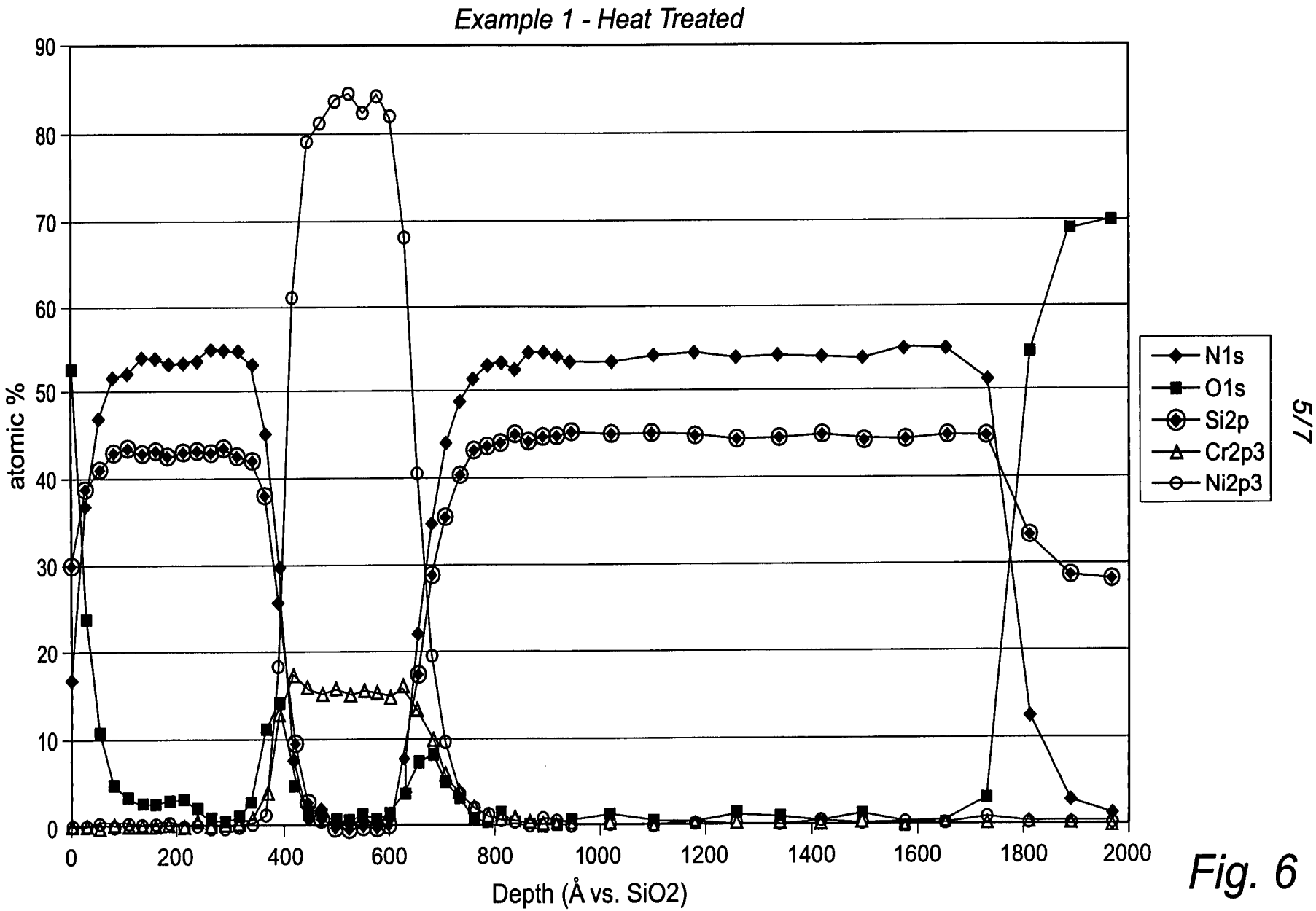
Example 1 - Heat Treated
atomic %
Depth (Å vs. SiO2)
N1s
O1s
Si2p
Cr2p3
Ni2p3
0
10
20
30
40
50
60
70
80
90
0
200
400
600
800
1000
1200
1400
1600
1800
2000

Fig. 6

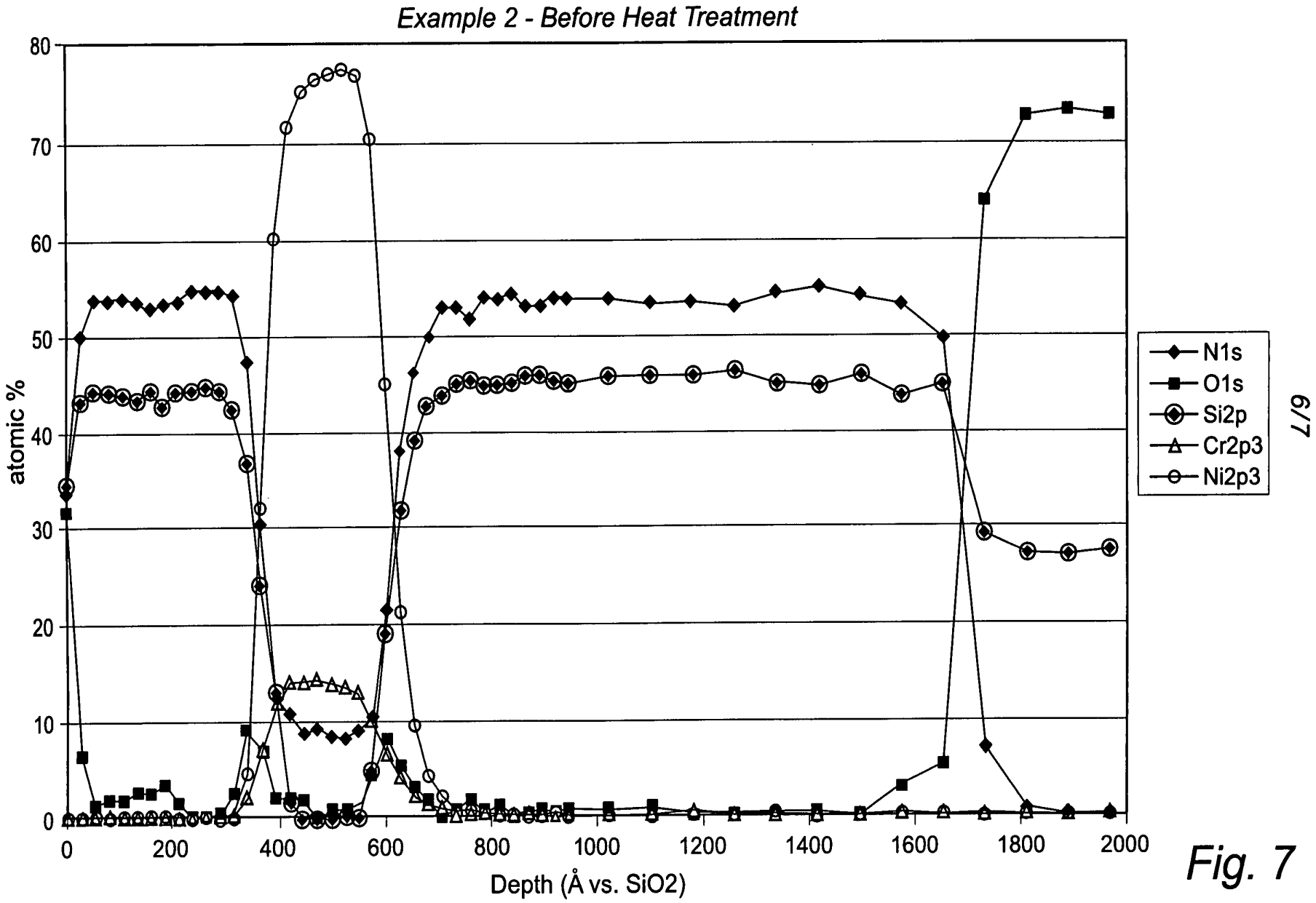
Example 2 - Before Heat Treatment
atomic %
Depth (Å vs. SiO2)
N1s
O1s
Si2p
Cr2p3
Ni2p3
0
10
20
30
40
50
60
70
80
0
200
400
600
800
1000
1200
1400
1600
1800
2000

Fig. 7

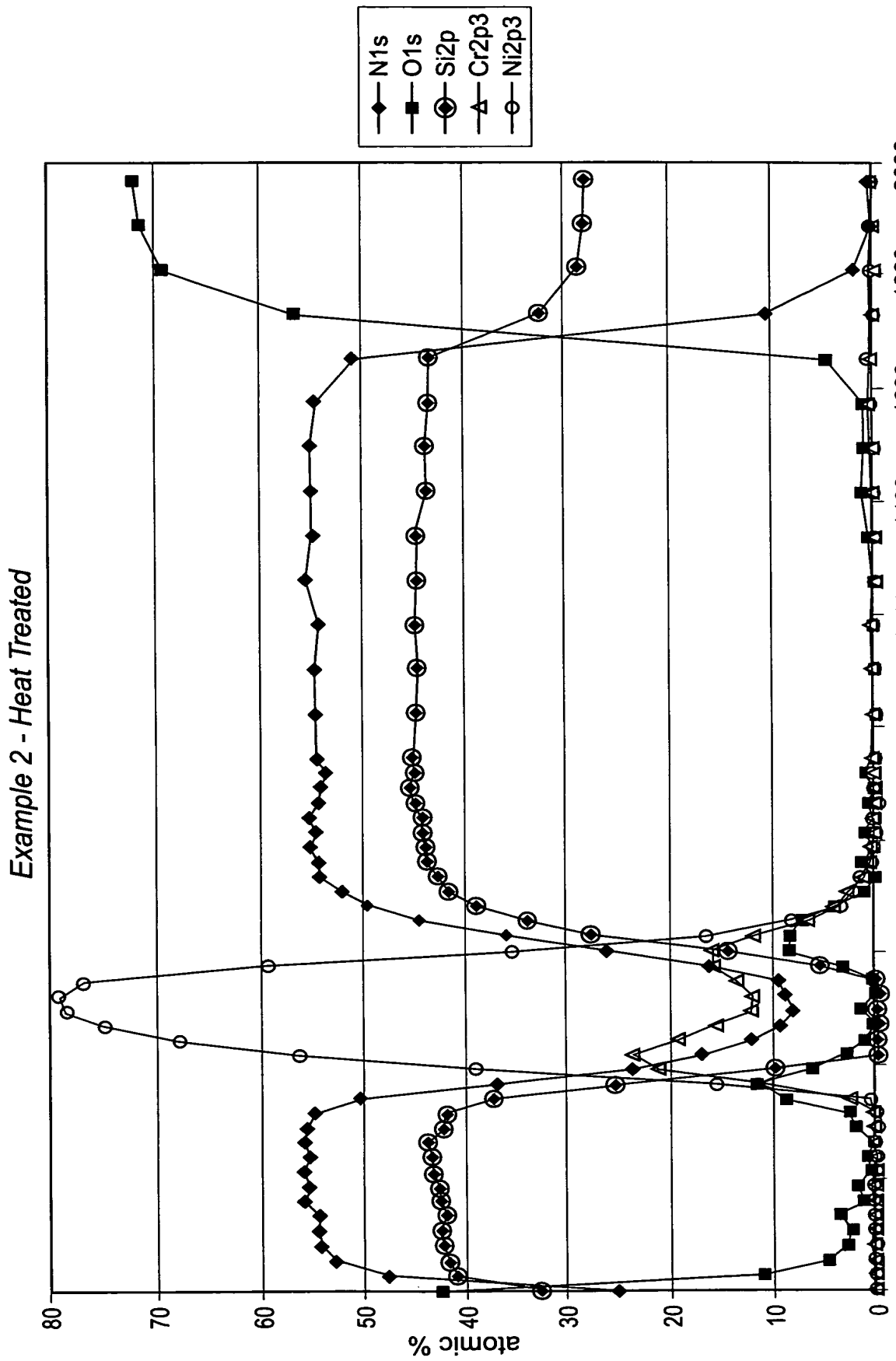
Example 2 - Heat Treated
N1s
O1s
Si2p
Cr2p3
Ni2p3
atomic %
Depth (Å vs. SiO2)
0
10
20
30
40
50
60
70
80
0
200
400
600
800
1000
1200
1400
1600
1800
2000

Fig. 8